



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/681,400	10/08/2003	Leland Swanson	TI-35902	7441
23494	7590	03/21/2005	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			EVERHART, CARIDAD	
			ART UNIT	PAPER NUMBER
			2829	

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/681,400

Applicant(s)

SWANSON ET AL.

Examiner

Caridad M. Everhart

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-19 is/are allowed.
- 6) ☒ Claim(s) 1, 8, 20, 24 and 29 is/are rejected.
- 7) ☒ Claim(s) 2-7, 9-12, 21-23 and 25-28 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10-8-2003</u> . | 6) <input type="checkbox"/> Other: ____ |

Specification

The abstract of the disclosure is objected to because of the including of the recitation "comprising", as the Abstract should not include legal terms such as used in the claims. Correction is required. See MPEP § 608.01(b).

Claim Objections

Claim 28 objected to because of the following informalities: Claim 28 recites "further comprising" twice. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 8, 20, 24, and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Grover, et al. (US 2003/0022474A1).

Grover, et al disclose a Schottky device and method of forming (first two lines of paragraph 0019) in which the substrate is of a conductivity type (paragraph 0039).

There is also disclosed a guard ring (paragraph 0078) structure which includes a gate of a different conductivity type (paragraph 0055). The gate has an insulation layer over which the gate is formed, which is interpreted as a gate dielectric (paragraph 0055). In Fig. 11 it can be seen that there are barrier regions 15s (described in the abstract as

Art Unit: 2825

guard regions, but because of their doping these are interpreted as barrier regions). The layer 33a is a metal layer (paragraph 0065, as is the layer 33(paragraph 0065). Layer 33a is silicide (paragraph 0040). The layer 33a may have a metallurgical barrier such as TiN on it (paragraph 0066). It is disclosed in the Abstract that the Schottky barrier is self-aligned with the barrier regions 15s(described as guard regions), and it can also be seen in Fig. 2 that the Schottky barrier 80 is self aligned with 15s(paragraph 0042). There is also a depletion region under the gate dielectric and the barrier region(paragraph 0081 and Fig. 1, feature 14). The limitation "over the substrate layer" is interpreted to include that the substrate layer may have trenches therein as disclosed by Grover, et al, and then layers formed over the trenches are interpreted to satisfy the limitation "over the substrate layer". The providing of the guard ring structure is a method of mitigating perimeter edge effects of a Schottky diode, as Grover, et al include Schottky diode (end of paragraph 0001) as the devices which can benefit from the structure(benefits are implied in second half of paragraph 0004), which would include perimeter edge effects, as this is implied by the providing of a guard ring.

Allowable Subject Matter

Claims 13-19 are allowed.

Claims 20, 7, 9-12, 21-23, 25-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-


Art Unit: 2825

272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Everhart
3-17-2005


C. EVERHART
PATENT EXAMINER
COMMUNICATIONS SECTION